PROPOSAL TO CREATE A FIRE TRAINING FACILITY FOR THE WOODLANDS, TEXAS

Executive Development

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ABSTRACT

The problem identified for this applied research project was that the Woodlands Fire Department does not have a fire training facility within its jurisdiction. The purpose of this report was to determine the type of facility best suited for the department and to find adequate funding for the construction of the facility.

This was an action research paper as interviews were the primary source of construction and funding information. Sources from the National Fire Academy's Learning Resource Center were essential in completing the literature review portion of the research process. To complete the research, four questions needed to be answered:

1. What is the cost of constructing a training facility that would meet the needs of our community and county?
2. Does The Woodlands Fire Department's current five-year capital and operations budget allocate enough money to cover the cost of constructing a fire training facility?
3. Are there secondary sources of funding available to offset the cost of building a fire training facility?
4. Is there interest from Montgomery County and other neighboring fire departments to jointly construct a regional training facility to be located in The Woodlands?

With regard to procedure, I first reviewed The Woodlands Fire Department's five-year capital budget to determine its scope and constraints

relative to funding a fire training facility. Next, an initial cost projection was determined after talking with private construction contractors and two Houston area fire departments that had recently built training facilities. For secondary funding sources, I interviewed two government officials. A survey was mailed to all the surrounding fire departments in order to ascertain their interest in funding and/or use of a local fire training facility.

Although The Woodlands Fire Department has allocated money for the building of a fire training facility, it does not currently have enough funds to independently construct a full service facility. The results of my survey indicated that there is substantial interest from the local fire to fund or patronize a training facility located in The Woodlands, but the financial commitment from these departments may not be enough to create a regional training center. On the governmental level, there is only political support to facilitate the development of a consortium to build and operate a facility.

The recommendation of this paper is that the department funds an independent training facility. To offset the initial cost of construction, The Woodlands Fire Department should apply for a grant from the Texas Commission on Fire Protection. Any access fees paid by local departments would offset yearly operating costs.

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INTRODUCTION

The community expects its fire department to be able to handle the demands that are placed on it by its customers. Reliable, high performance service is key to maintaining a positive relationship with the community and ensuring a motivated and confident workforce. To be able to meet these service demands, the fire department needs to be staffed with well-trained men and women that have been exposed to and drilled on the scenarios that they will be expected to handle while on the job.

The problem identified for this applied research project is that The Woodlands Fire Department does not have a fire training facility located within its jurisdiction. Therefore, the continuous, practical and realistic emergency service training of the department's personnel is hampered. In fact, as there are no fire training facilities located anywhere in Montgomery County, all area fire departments are forced to travel extended distances for their advanced fire training. The purpose of this report was to determine the type of facility best suited for the department and to find adequate funding for the construction of the facility so that the my growing community service demands are met.

Obtained via inter-library loan, sources from the National Fire Academy's Learning Resource Center were essential in completing the literature review portion of the research process. Insurance Services Office manuals from my own private library were also used. Action research tactics involved discussing the construction and cost issues with three private contractors, two Houston-area fire department chief officers, and two government officials – Congressman Kevin

Brady and Montgomery County Judge Alan B. Sadler. Essential to the research was creating, distributing, and evaluating a survey instrument of twelve questions mailed to nineteen local fire departments.

The research questions for this study were:

1. What is the cost of constructing a training facility that would meet the needs of our community and county?
2. Does The Woodlands Fire Department's current five-year capital and operations budget allocate enough money to cover the cost of constructing a fire training facility?
3. Are there secondary sources of funding available to offset the cost of building a fire training facility?
4. Is there interest from Montgomery County and other neighboring fire departments to jointly construct a regional training facility to be located in The Woodlands?

BACKGROUND AND SIGNIFICANCE

"Without an effective, consistent training program, a fire department severely compromises its ability to protect life and property. Additionally, it jeopardizes the safety of its own personnel and possibly that of other firefighters. It is, therefore, incumbent upon all fire agencies to develop and maintain training programs that are not merely adequate, but that promote greater safety, efficiency, and relevancy in all facets of fire suppression" (Covey, 1978, p. 20). The need for aggressive, real life training is the cornerstone for successful fire service delivery. Fire training provides department members the tools necessary to professionally respond to and handle emergencies.

The Woodlands, Texas is a rapidly growing suburban community of close to 55,000 residents. It is located north of the city of Houston. This proximity to a thriving metro center has created rapid commercial along with residential growth. In turn, it has caused The Woodlands Fire Department to no longer provide coverage to a customer base which is primarily only residential. As well as the development of a regional mall and shopping area, The Woodlands skyline now includes both mid and high-rise buildings, heavy manufacturing plants, chemical research facilities and a booming biotechnology center called the Research Forest. What was once mostly a bedroom community now maintains a flourishing business sector. These new residents to the community have brought with them a demand for an expanded scope of service needs. The Woodlands Fire Department now has to meet these new challenges.

Politically, The Woodlands is master-planned, non-incorporated area of Montgomery County. An elected board of residents that represent various areas of the community carries out traditional governmental functions. A private company, The Woodlands Community Service Corporation provides all of the administrative work for the boards. The Woodlands Fire Department, Inc. provides exclusive contractual service to the area known as The Woodlands. As The Woodlands is not a recognized political subdivision of the state, all income that comes into the Community Associations are based on homeowners fees calculated on the assessed value of their home or property. No sales tax or impact fees are collected. Although the assessed value of the community is nearly four billion dollars, the lack of any taxing authority limits the scope of service that can be provided to the residents.

Currently, The Woodlands Fire Department is limited in its ability to provide structural fire fighting training to its members. Education is presented to all members through lecture and classroom activities, or by completing outside "hose laying" drills on empty streets or parking lots. Advanced training is available to a small number of firefighters through utilization of regional training facilities. Recently, and at no cost, The Woodlands has been able to send one engine company at a time to the Houston Fire Department's training facility to participate in live fire training scenarios.

It was during the 1999 fiscal year budget preparation that the department began to explore the possibility of constructing a training facility for the first time. It was anticipated the facility would be built in conjunction with the opening of our

new station five. The department committed $214,000 to the five-year capital budget to insure the project was on the books. Subsequently this became the reason behind my research paper.

During my two week Executive Development class, I was exposed to the need for public agencies to look for alternate funding sources via entering into partnerships with other service providers in order to maximize efficiency and control cost. As I began looking at the actual cost of developing training facility, it became apparent that the scope of the project may exceed the financial resources my community. These factors drove my research into exploring a secondary regional solution that could make a training facility in The Woodlands a reality.

LITERATURE REVIEW

To adequately research a community needs with regard to building a training facility, I utilized a number of different sources to get the best overview of other department's experiences. The National Fire Academy's Learning Resource Center was the primary source of information, along with using the Internet to "surf" for applicable information. As this is an applied research paper that deals specifically with The Woodlands, and Montgomery County, Texas, I chose to interview Montgomery County, Texas Judge Alan B. Sadler, and our district's United States Congressman, Representative Kevin Brady for possible funding assistance. To determine the cost for constructing a facility, I corresponded via mail and telephone with manufactures of fire training facilities. To determine the financial impact of having or not having, a training facility built that met my community's needs, I referenced the *Insurance Services Offices (ISO) Fire Suppression Rating Guide* and associated Handbook.

"How much is this going to cost me" and "What is the bottom line" are the focal points of any major capital project. These underlying principles fueled my first research question-What is the cost of constructing a training that would meet the needs of our community and county?

The needs of the community can be answered by looking at the physical make-up of the structures and target hazards found throughout the fire district. Specifically, this is based on the number and height of the buildings (number of stories) and the need for an in-service ladder company. (*ISO, 1980, Item 580*). Outlined in The Woodlands Fire Departments current Classification Details report

is the requirement for an in-service ladder company. For a community with such a requirement, ISO specifies that the department's training facility must - at a minimum - have a drill tower of four stories and a live fire burn room to receive full credit.

The first reference I used was an article by Roger M. Leboef, P.E. "*Basic Steps to Plan and Construct a New Fire Training Burn Building*". Leboeuf's article outlined the steps needed to accurately plan and select a facility. This enabled me to accurately determine the size and layout of the facility desired by The Woodlands Fire Department.

Symtron © Systems are a primary provider of computer controlled gas fired burn rooms. They provided me with an overview of the initial general costs associated in building a training facility per my specifications. Terry Hammond, the Texas sales representative for Symtron © provided valuable construction cost information. I selected Mr. Hammond as a reference source as he has worked on multiple fire-training sites. After I described to him what I was looking for in a facility, he mailed to me a complete set of architectural drawings and an associated price sheet. In general, the industry standard for a pre-fabricated metal building is $85.00/square foot, not including site costs (Hammond, Terry phone interview). His "Rough order of magnitude" (ROM) quote was based on a, "five story 3,720 square feet pre-engineered metal training tower and burn building, an environmentally safe live fire training simulator, a ventilation system, and a high temperature lining & thermal smoke generation system". The building itself came in at $373,000. This was broken down into construction costs at

$316,200, architecture and engineering services at $25,296, and a 10% contingency at $31,620. The real cost factor of the facility though is in the fire props. As The Woodlands is a primarily concerned with presenting an environmentally friendly appearance, the best training fuel option that my department has is to burn natural gas or propane. The starting price for the first prop was $250,000. To maximize the training opportunities, two other props were suggested. These props came in at $197,000 each, for a subtotal price on live fire training props of $640,000. Thereby fire props alone accounted for nearly two-thirds of the building budget. The total price for the facility (not including site work) came in at $1,018, 116. (Appendix G).

To cross-reference the construction price quotes, I then interviewed Mr. Mike May of Wesco © Fire Training Towers. Mr. May was selected for an interview, because his company is a nationally recognized manufacture of training facilities. Mr. May provided me a cost package for various size-training facilities that his company produces, and their associated construction costs. A comparable building to the one quoted by Symtron © was the WH-4 Training Tower. (Appendix H). This is a two-story residential style with a four-story tower. The cost quotes that I received were $ 133,575.00 for the building, (including basic class “A” fueled burn room), and $ 54,100.00 for the erection of the building. This brought the total cost, but not including site work to $186, 675.00. (Wesco, 1997)

I then contacted via phone John Munch of the Pearland Texas Fire Department. Mr. Munch was interviewed for my paper for two reasons. His

department has recently installed a Wesco WH-4 training building and the Pearland Fire Department is a local area department. Mr. Munch was able to inform me of the actual cost for installing their building. The required slab work was $ 14,000.00, and the building with their upgrades came in at approximately $ 250,000.00. He had originally cost out a concrete building. However, it would have cost 50% more than the metal facility, therefore he did not explore concrete construction any further. As for their burn rooms, the Pearland Fire Department was planning to plumb in their own propane system; therefore I was unable to compare their cost experience with a pre-manufacture fire system. (John Munch, personal communication, October 1998).

The Laporte Fire Department was used as a research source as it had recently built a concrete training facility that included a multi-story burn building, a single story burn house and a drafting pit. Chief Champ Dunham provided the cost of this facility that was constructed in 1992. The total cost for the facility was $ 1,500,000.00. Broken down, the residential cottage cost $111,000.00, the Multi-story burn building cost $436,000.00 and the drafting pit $41,000.00. The remainder, $912,000.00 paid for the land, utilities and an adjacent pistol range for the police department. The Laporte Fire Department burns class “A” combustibles for fuel, therefore there are no associated costs for computer controlled fire units. (Dunham, Champ, personal communication, November 1998)

Swede Survival Systems are a makers of “Flash Over” simulators. I requested a cost outline from them (Appendix I), as I was interested in

determining if this system provided cost-savings over a propane simulator. John Hunter, the president of the company forwarded to me an overview of how their training system worked, and the various fire departments that used it. He provided a written quoted of $ 32,350.00, for the simulator. This cost also included three days of train the trainer classes on the system.

The other type of “cost” associated with a training facility is not building it. Harry E. Hickey, in his *Fire Suppression Rating Handbook* discusses the financial impact of Fire Department training on a community. “ The training item in the *Grading Schedule* is one of the most important topics to evaluate for two reasons: 1) Studies of fire department effectiveness clearly indicate there is a positive correlation between levels of fire fighter training and reductions in property loss from working type structural fires. The better the training in basic fire suppression skills is, the higher will be the value of property saved during fires. 2) Training accounts for nine percent of the total city grading. This weight represents nearly one class level in the PPC structure.” (Hickey, 1993, p. 162). By not constructing a training facility, The Woodlands, with nearly four billion dollars of assessed value, would be forfeiting the potential premium savings for all of our commercial and residential customers.

My second research question was specific to my department-Does The Woodlands Fire Departments current five-year capital and operations budget allocate enough money to cover the cost of constructing a fire training facility? To answer this question, I began by reviewing *The Woodlands Fire Department’s five-year capital plan*. In it, I found that in the year 2001, $50,000 had been

assigned to cover planning costs associated with Station Five/Training Facility. In Fiscal year 2002, the sum of $850,000 had been budgeted to cover construction of Station Five/Training Facility. (The Woodlands Fire Department Incorporated. Five-year plan, 1998). This information all was based on a dual facility that shared site work cost including utilities. To get a better understanding of how much it cost to build just a fire station, I reviewed the budget package for the construction of The Woodlands Fire Department Station Four. The total cost of construction in 1997 was $ 636,000.00, thus I anticipated having $ 214,000.00 available to build a training facility. Also found in the five year plan is the fact that the Montgomery County Sheriffs Department is scheduled to vacate the office space adjacent to the Woodland Fire Department's central station. Along with this office space, there is a large parking lot and a section of undeveloped property adjoining an undeveloped tract of land directly behind the station. As this property is already part of the Woodlands Community Association, it could be developed into the training site at a low cost, thus saving a considerable sum of capital money.

Stephen C. Rondinelli's wrote in his Executive Fire Officer Research Paper, *Consolidated Fire Training Facility and Architectural Design Program* that, "This program was guided by NFPA Standard 1402, Building Fire Service Training Center, and specific needs identified by the task force committee on the North metro Fire Rescue Consortium. The architectural program analysis and requirements are divided into Administration/Support Facilities and Outside Facilities…" (Rondinelli, 1990, p.6). His paper described an additional 10,300

square feet of office, classroom and maintenance areas associated with the design of their training facility. This additional area and construction cost was in addition to the training building itself, and would need to be taken into consideration when choosing a site for the training facility.

The third question of my paper was “Are there secondary sources of funding available to offset the cost of building a fire training facility? I began my literature review on this area of my paper by reading an online article by Susan Latham Carr of the *Star-banner*. She reported that the city of Ocala, Florida was being awarded a 3.5 million-dollar grant to build a state-of-the-art firefighter training facility. “The grant, from the Federal Aviation Administration, represented 90% of the 3.84 million needed for road work, construction of the training tower and other work during the current phase of the project. The other 10% would be paid equally by the Florida Department of Transportation and the City of Ocala.” (Carr, 1996) This article gave me the idea to research government funding as a secondary source of revenue.

I contacted the office of my United States Congressman, Kevin Brady for assistance in finding federal money that could be used to build a regional training facility. I was put in touch with one of his office aides, Stephanie Drew. During our meeting at the office of the Congressman on October 1, 1998, Ms. Drew gave me the background information on how to find and select federal grant money. Specifically, she provided me a copy of the *1998 Catalog of Federal Domestic Assistance* to research. The grant I found most applicable to creating a fire service training center for The Woodlands Fire Department was through the

Department of Agriculture's Rural Housing Service: 10.766 Community Facilities Loans and Grants. I believe that my project fit this grant because it met the following application requirements: a) Use and Restrictions: Community facilities include but are not limited to those providing or supporting overall community development such as fire and rescue services…All facilities financed in whole or in part with RHS funds shall be for public use. b) Applicant Eligibility: City, County, and State agencies, political subdivisions of States and associations including corporations…1) Are operated not for profit; 2) have or will have legal authority necessary for constructing, operating, maintaining the proposed facility or service and for obtaining, giving security for, and repaying the loan. (Catalog of Federal Domestic Assistance, 1998).

A separate meeting with Congressman Brady was scheduled for October 22, 1998 to discuss creating a training facility and using this particular grant as a source of funding. During that interview, Congressman Brady conveyed support for my program. Along with talking about federal money through the Department of Agriculture, Congressman Brady felt that a facility of this type would be better off funded through a local or state college, as they would be a more receptive group to work with in regard to a federal agency. Congressman Brady, suggested that I explore a relationship with Texas A&M University, as they are the primary provider of emergency service training for our state's fire service. Congressman Brady provided me with a contact name, Chief Rick Tye. (Congressman Brady, personal communication, October 22, 1998).

To research the local political scene for possible sources of funding, I met with the County Judge Alan B. Sadler on October 12, 1998. Judge Sadler was also supportive of building a training facility for the county. Financially, there was no county money readily available. All of the County's Rural Fire Protection Districts had recently switched to Emergency Service Districts, and had raised their individual tax rates in some cases as high as 300%. Judge Sadler did suggest the development of a consortium of all of the local fire departments to jointly construct and operate a training facility paid for out of the increased tax revenues that were now being collected. Sadler pointed out that by spreading out the financial impact throughout a number of departments, and by financing the debt over fifteen to twenty years, the actual yearly operating cost could possibly be in some case less that what departments are currently spending to go outside Montgomery County to train. Judge Sadler then offered to help oversee the financial section of the business case that would be used to sell the program to The Woodlands governing body and the Montgomery County Chiefs Association. Judge Sadler also provided me the name and number of Mr. Driebelbus of the First National Bank of Conroe. Mr. Driebelbus could be a source of financing and provide further assistance in setting up a consortium so that financing could be secured. (Judge B. Sadler, personal communication, October 12, 1998).

The Federal Emergency Management Agency publication *A Guide to Funding Alternatives for Fire and Emergency Medical Services Departments* provided information for locating various sources of funding outside a department's normal operating and capital budgets. The first source of funding I

looked at was from the State of Texas. The Texas Commission on Fire Protection has one million dollars available to the state fire service. “Fifty percent of the money is available in grants, while the remaining fifty percent is in the form of low interest loans.”. (FEMA, 1993, p. 121). Insurance surcharges are also a source of funding available to the fire service of Texas. “These funds are generated through homeowners insurance, and are available to help pay for local fire protection programs.”. (FEMA, 1993, p. 84). The issue of development impact fees was an issue that should be researched further. These fees are “ most pertinent to communities that are growing or where redevelopment creates a need for new fire stations, apparatus or other resources. The main advantage of these fees is that the private sector pays for much of the new stations, apparatus and land”. (FEMA, 1993, p. 52).

A caveat to utilizing secondary sources of funding was found in Koelz’s EFOP paper, *Fire Service Financial Management*. In his paper, Koelz’s discusses the alternate source of funding paradox, while “ Today’s fire departments are competing for more funding with shrinking sources. Fire chiefs must be creative and innovative to seek out other types of funding or merely exist and not improve service”. (Koeltz, 1997, p. 17). Unfortunately, Koeltz warned that, ”before diving into alternative funding, it is recommended that Fire Chiefs examine the pros and cons. A program may sound good and profitable on the outside, but the community may react negatively”. (Koeltz, 1997, p. 17).

The concluding question that my paper addressed was “Is there interest from Montgomery County and other neighboring fire departments to jointly

construct a regional training facility to be located in The Woodlands?" Here, my primary area of reference review was finding articles that explored developing partnerships between fire departments. I found in California, three neighboring cities –Anaheim, Garden Grove and Orange came together to create a joint training and communication center. These cities felt that it was in their best interest to pool their resources. Their shared objectives for the consortium were: 1) Raise the efficiency of the various fire departments through effective utilization of manpower and facilities. 2) Reduce overall cost by avoiding duplication of facilities and efforts. 3) Make the training process more meaningful by providing adequate facilities and a comprehensive training program. 4) Standardize various training programs and improve fire-fighting methods by providing a facility for joint training. 5) Eliminate training facility deficiency points levied against participating cities by the Insurance Service Office of California. (Covey, 1978, p.20). This consortium of California cities closely mirrored my idea of developing a training facility that could aid all of Montgomery Counties fire departments, and that would be both practical and cost effective.

This consortium approach was used in Ohio as well. Municipal and private groups came together to create and jointly fund a training facility. The Oregon (Ohio) Fire Department formed a user's group to develop a state-of-the-art facility. The group consists of the Oregon Fire Department, BP Oil Company, Sun Refining and Marketing Company, Toledo Edison and it subsidiary Davis-Besse Nuclear Power Station. The operation, administration, scheduling and budgeting for the training center is controlled by a committee consisting of one

representative and alternative from each participating organization. (Michard, 1991, p. 42).

In summary, the literature review process introduced me to a wide range of information. It allowed for the foundation of answering each research question and brought more possible solutions to my attention.

PROCEDURES

Developing a training facility is a complex task that requires a logical plan to guarantee success. The starting point for determining the design of any training facility is *NFPA 1402, Building Fire Service Training Centers*. This standard, along with and analyzing my survey of surrounding departments, which specifically asked what each department was looking for in a training facility, provided the outline of what would be the best facility for my area. These two reference sources provided the mechanism used to determine the scope and associated cost of my first research question.

My interaction with manufactures of training facilities and local departments who had previously constructed training facilities aided me in estimating the cost of the proposed Woodlands training facility. By looking at three manufactures of training facilities, I was able to estimate that the cost of building a metal training building with either class “A” or natural gas fired burn rooms. The interview with the Pearland Fire Department provided information on the real cost of metal construction. The Laporte Fire Department provided information on the cost of their concrete facility. Their data led me away from investigating a similar type of construction as an option due to the increased cost over a metal building.

My second research question, is there enough money currently assigned to build a facility was answered by reviewing the 1998 five-year capital budget, and then matching that with the estimated cost of construction of the needed facility. By having various configurations to look at from answering question

number one, and by analyzing the response to my survey of local departments, an approximate cost could be estimated for construction.

Two cost estimates were looked at. The first was the cost for a stand-alone facility funded only by The Woodlands Fire Department. This cost was based on having an ISO compliant burn building and drill tower, along with a separate flashover simulator and drafting pit. My researched indicated that this facility would have to be based on the Pearland Wesco © facility, with the addition of a Swede Survival Systems “Flashover” trainer and drafting pit.

The second estimate was for a larger, regional type training facility that could serve all of Montgomery County. This cost projection was based on the Symtron © systems plan. The needed additional costs, such as site preparation (20% of building cost) and 10,000 square feet of support buildings ($65,00/foot) were added to the construction estimate.

As a regional facility was to be built and funded through a consortium, an estimate of how many departments would be involved in the program was needed. The estimate was based on the response to my survey question that asked if the department answering the survey was interested in participating in a joint training facility. This estimate of participating departments was then used to determine each department’s yearly principle and interest cost on a fifteen-year note. An interest rate of 7.5% was used for the calculation.

Secondary sources of funding where then explored. The primary source of secondary funding being the development of a consortium of local departments that would jointly construct and operate a training facility. In my October 22,

1998 interview with Congressman Kevin Brady, and my October 12, 1998 interview with County Judge Alan B. Sadler the issue of developing a consortium of users, be it local or in conjunction with a college or university, was the primary theme for both officials.

Congressman Brady, in a follow-up meeting, provided me the name of Chief Rick Tye of Texas A&M University. The Congressman had spoken to Chief Tye concerning my project. As of this date, I have not contact Chief Tye concerning developing a training facility partnership, and is thus a limitation to my paper.

Secondary limitations on my research on alternate funding sources were that I was not able to interview two other important State government officials. I mailed out letters to State Senator Michael Galloway, and State Representative Tommy Williams requesting an interview. In both of cases, I never received back a reply on my request to speak with them.

Funding available from the Texas Commission on Fire Protection, and the possibility of tapping fees associated with home-owners policies, are also sources of secondary funding for both an independent or jointly constructed facility. As the amount of these fees could not be accurately calculated, they were not factored into the cost of construction.

Along with these two sources of funds to help offset construction, an independently constructed facility could use the income generated when external departments used the training facility. This income stream was based on data

gained from my survey. I specifically asked if those surveyed departments would patronize a Woodlands area training facility.

The last research question actually helped drive the answers for the first three questions. I developed a survey instrument to determine the interest level of area fire departments in regard to funding and/or using a local training facility.

Survey

The population that I selected for my survey was all of the fire departments located in Montgomery County, and four Harris County fire departments that border The Woodlands, or are on The Woodlands Fire Departments run card assignments. (Appendix J). The survey asked eleven questions, divided into five general areas:

1) Do you currently use off site training facilities? If yes, how often?
2) What is your current budget for off site training?
3) If available, would you use a training facility located in The Woodlands? How often would you use it and how much would you pay for this access?
4) What facilities and props would you want to see in a training facility?
5) Would you be interested in going into some form of partnership to help fund construction of a training facility, and how much would you be willing to pay?

There were limitations to my survey though. Primarily, I only had 63% of surveyed departments respond. Of the responding departments, there was no way to determine who specifically supported aiding in construction, and who only

wanted to pay for access. Lastly, the amounts that I had identified on the survey in regard to access and construction fees did not accurately reflect actual costs of construction.

RESULTS

As I completed my research, a functional funding and development plan began to take shape that involved two different types of training facilities. Each facility had separate funding mechanisms. The first facility would be build by The Woodlands Fire Department. It would be for the primary use of The Woodlands Fire Department, with outside agencies paying for access. The second plan involved creating a larger scale, regional training facility that would be funded through a consortium of departments.

The first research question, what would be the cost of constructing a facility was answered by using the *ISO Fire Suppression Rating Schedule, section 580*. The training building that was required by ISO to receive full credit on the grading schedule had a minimum four-story drill tower with an attached burn room. The proposals sent to me by the Symtron © systems, Wesco Fire Facilities Inc., both met this standard, and were analyzed for cost effectiveness. These bids in turn were compared with the actual construction costs that of the Pearland and LaPorte Fire Departments newly constructed fire-training facilities. This analysis was used to develop an approximate cost for building the training facilities.

In addition, the information gained from Mr. Lebouf's article and Mr. Rondinelli's research paper regarding the associated buildings and facilitates that go along with a fire training building were also used to estimate the final total cost of construction.

A Woodlands only training facility would include a WESCO Fire Facilities Inc. WH-4 metal training tower and burn rooms. To come within a reasonable amount of currently budget dollars, a class “A” combustible fueled burn room(s) would need to specified instead of the more expensive Symtron controlled gas fired burn rooms. Yet, the potential negative environmental impact of burning class “A’ fuel at the facility might prevent this fire source from being a viable option. If this were found to be the case, then a propane fuel burn system would have to be added at a later date, although the building would still be used as a training site. This design type, using the Pearland Fire Department’s construction cost would come in at approximately $250,000.00. (Champ Dunham, personal communication, October, 1998.). To allow for realistic Flashover training, a Swede Survival Systems trainer was added at a cost of $ 32,350.00. (Appendix I). Again, the potential negative environmental impact of this class “A” fuel system might preclude it from being installed. To complete the site, a drafting pit could be added for $41,000.00 (Champ Dunham, personal communication, October, 1998.). This option would allow for easy ISO required yearly pump testing, and it also would be an income source as a majority of local departments indicated, via the survey, that they would like access to one. The total construction cost for this training facility is estimated at $ 323,350.00. The cost for land and needed support facilities, such as classrooms, maintenance and office areas need to be included in the budgeting and design of station five. However, The Woodlands could use, at a much lower price, the adjacent Sheriff

department's office space and parking lot and the abandoned Mitchell gas station property for construction.

A consortium funded and operated regional training facility would be larger and more advanced than the first facility. This projection would be based on the Symtron © systems plan at $1,018,116.00. The facility, at five stories, and with three computer controlled natural gas burn rooms would allow for state of the art fire training. Additional costs, including site preparation were estimated at $203,623.00 for site preparation were calculated by using 20% of building cost. $650,000.00 was estimated as the cost for 10,000 square feet of support buildings ($65,00/foot). This brought the total estimated construction cost for a regional type facility to $ 1,871,739.00. At close to two million dollars, if funded alone, would be cost prohibitive to most departments. As an expense that would be spread over six to eight departments and financed for fifteen years, the cost becomes a reasonable and manageable expenditure. Six departments financing $1,871,739.00, with no down payment over a fifteen-year period using an interest rate of 7.5% would have a yearly-operating expanse of $ 34, 702.50. With a 20% down payment of $ 374,346, or $62,391 per department, the yearly finance expense would be $27, 762.00.

The second research question-Does The Woodlands Fire Department currently have enough money available to construct a training facility was answered negatively. The current allocation of funds is not adequate to cover the construction of a training facility. Using the Wesco WH-4 training facility as the basis for construction cost, the facility is estimated cost is $323,350.00.

Therefore, the current allocation of funds assigned for a training facility would need to be increased to 51.09% or $109,350.00. To allow for the needed support facilities, the design and budget for station five would have to be included office, classroom and maintenance facilities. The adjacent office space and open areas that are being vacated by the Montgomery County Sheriffs department and the abandoned Mitchell gas station could be utilized. The specific costs associated with this plan were beyond the scope of this paper.

If the monies allocated to the five-year capital plan are used to fund a jointly constructed facility, then the current amount would be more than enough make a down payment on a facility. A twenty- percent down payment on a total construction cost of $ 1,871,739.00 spread over six departments would be $ 62, 391.00 per department. The yearly amount of money needed to service the loan would be $27,762.00. The total cost to the department over the estimated fifteen-year life of the loan would be $ 478,821.00 or 123.74% more than the original allocation of $214,000.00.

The results of my research on the third question, are there secondary sources of funding, was answered in two ways. First, as a result of my survey, and through interviewing Congressman Brady and Judge Sadler, there is political support for developing a consortium of departments to jointly build a regional training facility. Also, my survey indicated that 80% of responding departments would be willing to explore the possibility of developing a partnership to create a Montgomery County training facility.

If a consortium is not possible, then a smaller training facility could be constructed independently by The Woodlands Fire Department. Secondary sources of funding would be limited to a grant from the Texas Commission on Fire Protection, and if politically palatable, development fees and tapping homeowners insurance for cost recovery on providing service.

As indicated in my survey there will be a yearly cost recovery on operating expenses. Seventy-five percent of surveyed departments indicated that they would use a Woodlands training facility. Analyzing the data statistically by mode, the departments were willing to pay $200.00-250.00 a training session with a utilization frequency of over four times a year. I have estimated that The Woodlands Fire Department could receive up to $12,000.00 a year in user fees for access to a full service training facility.

This utilization of the facility by outside departments would not affect The Woodlands Fire Department regular weekday training program. Surveyed departments indicated that weekends (Saturday 92% and Sundays 77%) would be the most popular days that they would want to have access to the facility for training.

The development of consortiums to develop large-scale capital projects has been shown to be successful. As seen in Orange County, California, (Covey, 1978) and in Oregon, Ohio, (Michard, 1991) multiple agencies have come together to develop joint training facilities. This background research supported the findings of my survey, and help answer my fourth research question-Is there interest from local departments to develop a training facility? The results of my

survey indicate that 62% of local departments support some sort of regional facility.

DISCUSSION

As the research for this project progressed, two schools of thought on the type and scope of a training facility competed for my attention.

The primary issue dealt with the practicality of attempting to develop a consortium of area fire departments to come together and create a state of the art facility that would meet the needs of the county: or building an independent, training facility in The Woodlands that supplemented its operational cost by charging access fees to the surrounding departments.

The successful California and Oregon multi-jurisdictional facilities as described by Michard and Covey were the models driving a consortium approach to a regional facility. Optimistically, a regional fire training facility would be best for the county and The Woodlands. It would allow for the construction for a larger, more technologically advanced facility than what any one department could build on is own. The money allocated in The Woodlands five-year capital budget would fund a down payment and service the yearly principal and interest costs on the regional training center. This regional concept provides no immediate funding pressure to increase the $214,000.00 currently allocated for a training facility. Additional funding for the project would not be needed until 2007, thus allowing the community time to create alternative income sources to pay for capital projects. The immediate impact of creating a regional facility include:

allowing Woodlands firefighters access to a state of the art training facility, and providing the community and county a positive economic impact in regard to improving and/or maintaining our area's various ISO ratings.

Unfortunately, the political reality associated with Montgomery County needs to be analyzed much further before we embark on such a grand scheme. The support for funding a regional center as indicated in my survey is there, but would the level of funding potential actually support the real cost involved? Per my survey, 36.36% of departments pledge under $5,000.00, and 27.27% pledge between $5,000.00 - $10,00.00 towards paying for initial construction. Only one department would commit at the $10,000.00 - $20,000.00 funding level.

On the county level, made clear during my meeting with Judge Sadler, no financial support was available to assist funding a regional facility. This lack of governmental money, unlike the funding acquired by the City of Ocala, Florida for their regional facility, was also seen at the Federal level. Congressman Brady, although supportive of the project, preferred a partnership with Texas A&M University instead of pursuing a Federal Grant to assist in constructing for a regional facility.

This lack of governmental funding, the issue associated with Koeltz's secondary sources of funding paradox, and the uncertainty of the level of financial commitment from the county departments indicates that a stand alone facility, built by The Woodlands Fire Department might be the best way of answering the research problem as it has-at this juncture-the best opportunity for making the creation of a fire training facility in Montgomery County a reality.

Although smaller in scope than a regional facility, and possibly not having any live burn capabilities, a training facility built behind station one would meet almost all of the requirements of a training facility as indicated by NFPA 1403 and Rondinelli's paper. The increased capital cost of building a Wesco © WH-4 building and the associated yearly operational costs can be justified by the increased ISO training rating of having an in district training facility, and by the access fees for the building and drafting site that would be generated by local departments. Secondary sources of funding, such as a grant available from the Texas Commission on Fire Protection could also possibly take care of some of the up front construction costs.

Site selection would be integral to building a stand-alone facility. If immediacy is the most pressing issue, The Woodlands will have to take advantage of the open area located behind station one, and the soon to be vacated sheriffs department office space that is adjacent to the department's administrative office. Although there is money allocated to the design of station five to incorporate a training facility into the site plan, the needed classroom, administrative and maintenance facilities would overwhelm the amount of funds needed just to build a simple fire station. This design need and the economics behind it where described in detail in both NFPA 1403 and Bailer's *Drilling in the Desert* article.

RECOMMENDATIONS

This paper proposes that The Woodlands Fire department fund and builds an independent, Woodlands only training facility. The primary recommendation would be to increase the budgeted amount by $79,000.00 to allow for the construction of a Wesco WH-4 training building and on site drafting tank. The WH-4 training building, although having a burn room, would not be used for live fire training. The additional cost associated with installing an environmentally friendly propane burn system is cost prohibitive under the present community funding mechanism. Although it is over fifty miles away, The Woodlands Fire department would continue to use the Houston Fire Department's burn building as its live fire training site. To maximize community property use, and to keep cost down, the proposed training facility needs to take advantage of the vacated sheriffs' department office space and parking areas which are located behind station one.

This recommendation is the most economically practical. Yearly operating costs will be offset by the income generated from outside departments utilizing the training building and drafting site. The community will benefit by having reduced fire insurance premiums as a result of either maintaining or reducing the community's ISO rating. The Woodlands firefighters will have access to a facility that would provide them the experience and education needed to save lives and reduce property loss. Most importantly, our firefighters will have daily access to advanced training that reflects the new residential and large commercial hazards that face them.

Lastly, building a facility in The Woodlands does not prohibit the possibility of one-day creating a larger regional facility desired by many departments.

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The Woodlands Fire Department, Inc.

DATE: September 1, 1998

TO: Montgomery County Fire Chiefs

RE: Survey of interest in assisting in funding a training facility for all Montgomery County Fire Department's in The Woodlands

from the desk of...

Stephen E. Parker
Fire Training Officer
The Woodlands Fire Dept
9951 Grogans Mill Rd
The Woodlands, TX 77380

Tel: (281) 367-3444
Fax: (281) 367-2693
E-mail: separker@wcscwoodlands.com

I am currently enrolled in the National Fire Academy's (NFA) Executive Fire Officer Program (EFOP). As a part of my course of study, I am required to complete an applied research project that relates to the EFOP curriculum and that has bearing on my department.

As the Training Chief of The Woodlands Fire Department, I have decided to research the availability of secondary sources of funding to assist in the construction and/or operation of a training facility for Montgomery County Fire Departments. As you know, Montgomery County does not currently have such a facility and area departments must travel to off-site facilities (e.g., A&M) for training purposes.

To aid me in my research, I am asking you, as the Chief of a local department, to complete the enclosed survey regarding your department's interest in a fire service training facility located in The Woodlands.

Primarily I am interested in whether your department would assist with funding the construction of the facility; or, once constructed, your department's level of interest in using the facility.

Your response to this survey will be appreciated as it will aid me in writing an informative and practical research paper. Results from this research will be made available upon request.

Regards,

Steve Parker
Battalion Chief/Training

enclosure
SEP/csm
cc: Deputy Chief Bittner
Deputy Chief Walker
Congressman Brady
State Senator Galloway
State Rep Williams
County Judge Sadler

APPENDIX A

Survey of Local Fire Departments Regarding the Construction and Use of a Fire Service Training Facility in The Woodlands, Texas

Please answer the following questions regarding your fire department:

1. a) Population Served
   - ☐ Under 25,000
   - ☐ 25,000 - 50,000
   - ☐ 50,000 - 100,000
   - ☐ 100,000 - 200,000
   - ☐ over 200,000

   b) Department Type
   - ☐ Solely paid
   - ☐ Solely volunteer
   - ☐ Combination

   c) Response Area
   - ☐ Primarily Rural
   - ☐ Primarily Suburban
   - ☐ Combination

   d) Department Size
   What is the number of active firefighters in your department: _____

2. How often does your department currently use an off-site training facility? _____
   How much do you pay on an annual basis for use of an off-site training facility? _____

3. Would a training facility located in The Woodlands affect your department's use of off-site training?
   - ☐ Most definitely
   - ☐ Possibly
   - ☐ Not likely
   - ☐ Unsure

4. a) Would your fire department be interested in helping to fund the construction of a fire service training facility in The Woodlands if it allowed for discounted access to the facility?
   - ☐ Yes
   - ☐ No
   - ☐ Unsure

b) Which of the following choices would your department prefer in recognition of assisting in the initial funding or would guarantee initial funding?

☐ Pay for consumables only ☐ unlimited access

☐ Yearly recruit training program

c) Amount that would be available for initial funding from your department for construction:

☐ under $5,000

☐ $5,000 - $10,000

☐ $10,000 - $20,000

☐ $20,000 - $30,000

☐ over $30,000

5. What features would you want to see at a fire training center? (mark as many as you like)

☐ Classroom

☐ Drill tower

☐ Burn rooms

- ☐ Propane fueled
- ☐ Class A fueled

☐ Standpipe trainer

☐ Sprinkler trainer

☐ Haz-Mat props

☐ Drafting pit (pump test)

☐ Vertical ventilation simulator

☐ Confined space simulator

☐ Rappelling prop

6. If the WFD Training Center had the features you desired, what day of the week/time would your department most likely use a training facility?
(You may check more than one.)

☐ Monday – Friday Times: ☐ Morning

☐ Saturday ☐ Afternoon

☐ Sunday ☐ Evenings

7. How often do you foresee your department using such a training facility?

☐ Never

☐ Once a year

☐ 2-3 times a year

☐ 4 times a year or more

8. What is the flat rate maximum range you would pay for access to the facility per day if your department did not assist in initial funding of construction?

- ☐ $100 - $150
- ☐ $150 - $200
- ☐ $200 - $250
- ☐ $250 - $300
- ☐ $300 - $350
- ☐ $350 - $400
- ☐ over $400

9. Are you aware of the I.S.O. credit that your department would receive having a training center within five (5) miles of your district's boundary?

- ☐ Yes
- ☐ No
- ☐ Not applicable

10. Does the amount of credit affect your decision on funding a training center?

- ☐ Yes
- ☐ No

11. Is your department currently looking at constructing a fire service training facility?

- ☐ Yes
- ☐ No

If yes, at what type of time frame are you looking to begin construction?

- ☐ 1 month
- ☐ 3 months
- ☐ 6 months
- ☐ 1 year
- ☐ 2 years
- ☐ more than 2 years
- ☐ Other _____

12. Do you have any additional comments?

_____

_____

_____

_____

Survey of Location Fire Departments
Regarding the Construction and Use of a Fire Service Training Facility in The Woodlands, TX

Population Served

Under 25,000	4
25,000-50,000	7
50,000-100,000	1
100,000-200,000	0
over 200,000	0

Department Type

Solely paid	1
Solely volunteer	5
Combination	6

Response Area

Primarily Rural	1
Primarily Suburban	4
Combination	7

Department Size	30	42	44	35	30	25	18	70	70	120	30	54
Use Off-Site Trng per year now	5	3	6	4	2	2	1	NR	12	3	0	0
$ per year	2000	500	?	5250	750	2000	250	NR	5000	12000	N/A	0

Affect use of off-site

Most definitely	5
Possibly	4
Not likely	1
Unsure	2

Help Fund for Discount

Yes	5
No	0
Unsure	7

Recognition for funding?

Pay for consumables only	4

Survey of Location Fire Departments
Regarding the Construction and Use of a Fire Service Training Facility in The Woodlands, TX

Yearly recruit training program	3
Unlimited access	1
No response	4

$ for Initial Funding

under $5,000	4
$5000-$10,000	3
$10,000-$20,000	1
$20,000-$30,000	0
over $30,000	0
No response	3
Land	1

Features for Training Center

Classroom	5
Drill tower	11
Burn rooms	12
Propane fueled	8
Class A fueled	6
Standpipe trainer	8
Sprinkler trainer	7
Haz-Mat props	7
Drafting pit (pump test)	9
Vertical ventilation simulator	8
Confined space simulator	7
Rappelling propr	6

Day of Week/Time

Monday-Friday	3
Saturday	12
Sunday	10
Morning	8
Afternoon	6
Evenings	5

How Often Use Facility

Never	0
Once a year	0

Survey of Location Fire Departments
Regarding the Construction and Use of a Fire Service Training Facility in The Woodlands, TX

2-3 times a year	5
4 times a year or more	7

Flat Rate Max for Use

$100-$150	1
$150-$200	0
$200-$250	4
$250-$300	0
$300-$350	0
$350-$400	1
over $400	3
No response	2

Aware of ISO Credit

Yes	10
No	1
Not applicable	1

Does ISO Credit Affect Funding

Yes	4
No	7
No response	1

Your Dept Constructing Facility

Yes	5
No	7

If yes to above, when

1month	
3 months	
6 months	
1 year	1

2 years	1
more than 2 years	3
Other	

The Woodlands Fire Department, Inc.

DATE: August 28, 1998

TO: Congressman Kevin Brady
200 Riverpoint Dr, Suite 304
Conroe, TX 77304

RE: Interview regarding construction of a fire service training facility in The Woodlands.

from the desk of...

Stephen E. Parker
Fire Training Officer
The Woodlands Fire Dept
9951 Grogans Mill Rd
The Woodlands, TX 77380

Tel: (281) 367-3444
Fax: (281) 367-2693
E-mail: separker@wcscwoodlands.com

I am currently enrolled in the National Fire Academy's (NFA) Executive Fire Officer Program (EFOP). As part of my course of study, I am required to complete an applied research project that relates to the EFOP curriculum and that has bearing on my department.

As the Training Chief of The Woodlands Fire Department, I have decided to research the availability of secondary sources of funding to assist in the construction of a fire service training facility in The Woodlands.

To aid me in my research, I would like to schedule some time with you for an interview concerning the availability of federal funds that could be used to offset construction and/or operation cost of a training facility.

Any information concerning my research topic would be greatly appreciated.

Regards,

Steve Parker
Battalion Chief/Training

SEP/csm
cc: Deputy Chief Bittner
Deputy Chief Walker

APPENDIX D

The Woodlands Fire Department, Inc.

DATE: August 28, 1998

TO: Alan B. Sadler–Mont. Cnty Judge
301 N. Thompson, Suite 210
Conroe, TX 77301

RE: Interview regarding construction of a fire service training facility in The Woodlands.

from the desk of...

Stephen E. Parker
Fire Training Officer
The Woodlands Fire Dept
9951 Grogans Mill Rd
The Woodlands, TX 77380

Tel: (281) 367-3444
Fax: (281) 367-2693
E-mail: separker@wcscwoodlands.com

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Any information concerning my research topic would be greatly appreciated.

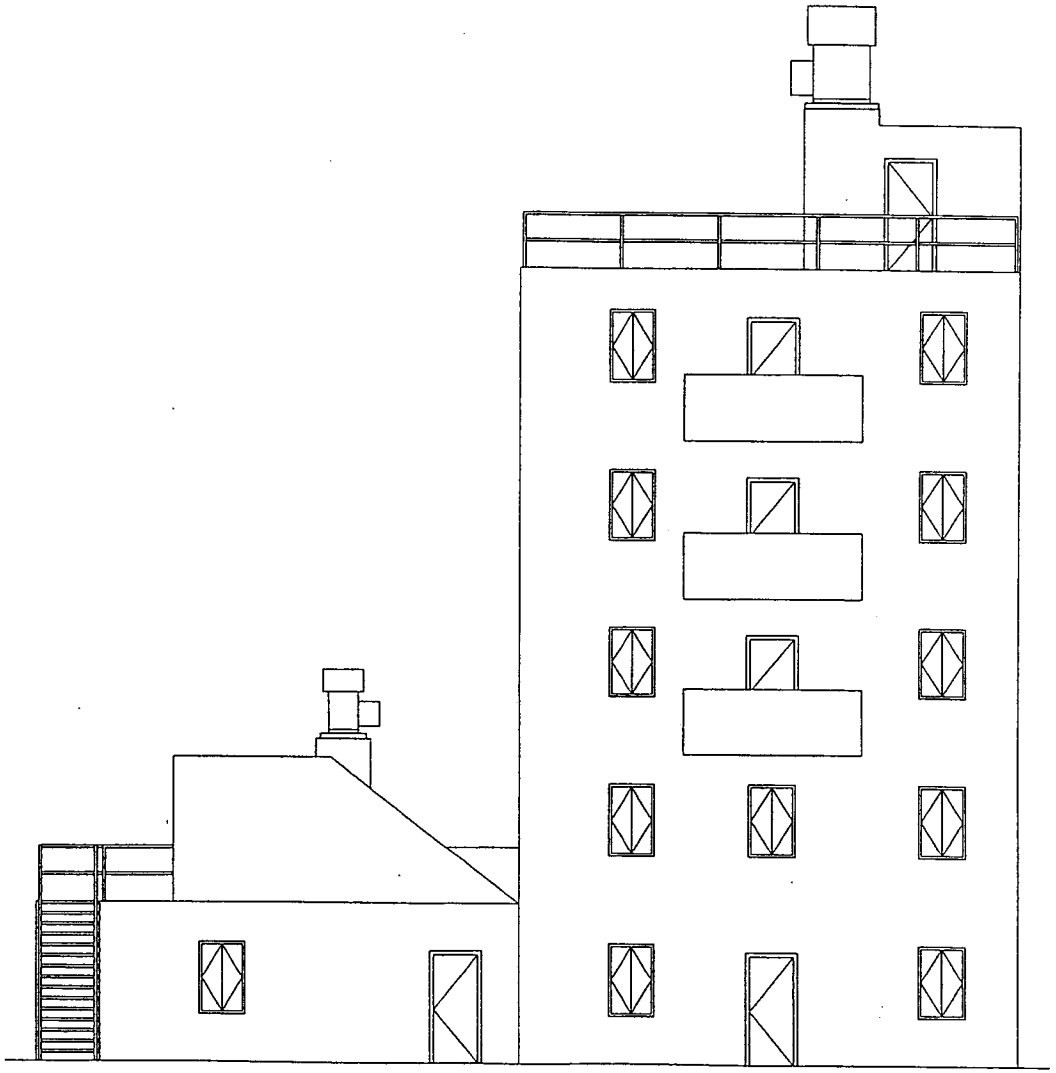
Regards,

Steve Parker
Battalion Chief/Training

SEP/csm
cc: Deputy Chief Bittner
Deputy Chief Walker

APPENDIX E

APPENDIX F



SYMTRON FIRETRAINER DEVICE CONFIGURATION

DEVICE TYPE - T-1000
FUEL TYPE - NATURAL GAS
FIREPLACES - FIRST FLOOR: LIVING ROOM
FIRST FLOOR: KITCHEN
THIRD FLOOR: BEDROOM

BUILDING CONFIGURATION

OVERALL LENGTH - 64'-0"
OVERALL WIDTH - 26'-0"
OVERALL HEIGHT - 65'-0"
TOTAL INTERIOR FLOOR AREA - 4,002 SQ FT
TOATL EXTERIOR DECK AREA - 1,362 SQ FT
FLOOR TO FLOOR HEIGHT - 10'-0"

REV	A	DATE	28OCT98	DWN	JRE	12OCT98
CHKD						10/29/98
ENG						10/29/98

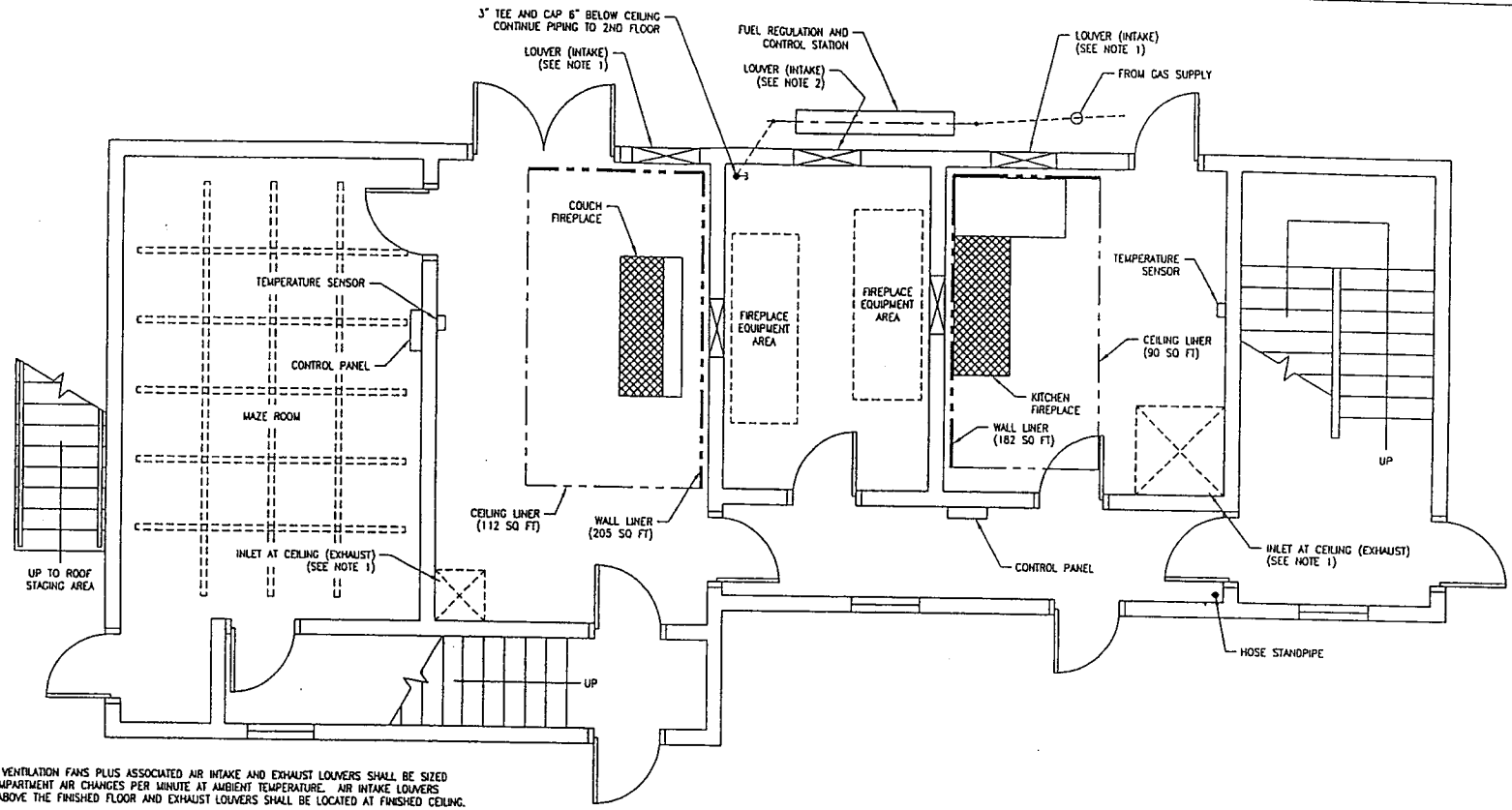
SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

SCALE	1/4" = 1'-0"	DWG NO	IGD-0091
CAD FILE	IGD0091A1	SHEET	1 OF 11

APPENDIX F



FIRST FLOOR

NOTES:

1. TRAINING COMPARTMENT VENTILATION FANS PLUS ASSOCIATED AIR INTAKE AND EXHAUST LOUVERS SHALL BE SIZED TO ACCOMMODATE 2 COMPARTMENT AIR CHANGES PER MINUTE AT AMBIENT TEMPERATURE. AIR INTAKE LOUVERS SHALL BE LOCATED 6" ABOVE THE FINISHED FLOOR AND EXHAUST LOUVERS SHALL BE LOCATED AT FINISHED CEILING.
2. EQUIPMENT ROOM AIR INTAKE LOUVERS SHALL BE SIZED TO ACCOMMODATE AN AIR FLOW OF 2400 CFM FOR EACH FIREPLACE EQUIPMENT AREA LOCATED IN THE ROOM. AIR INTAKE LOUVERS SHALL BE LOCATED 6" ABOVE THE FINISHED FLOOR.
3. EACH FIREPLACE EQUIPMENT AREA REQUIRES A NATURAL GAS FLOW OF 182 CFM AND EACH FLASHOVER ASSEMBLY REQUIRES A NATURAL GAS FLOW OF 91 CFM.
4. THE FUEL REGULATION AND CONTROL STATION REQUIRES AN INPUT PRESSURE RANGE OF 15 ± 5 PSIG.
5. GAS PIPES SHALL BE LOCATED 6" FROM ADJACENT FINISHED SURFACES.
6. REFER TO THE PIPE RISER DIAGRAM IN THIS DRAWING PACKAGE FOR THE ROUTING OF THE GAS PIPE IN THE BURN BUILDING. PIPE INSTALLATION SHALL ACCOMMODATE ALL CURRENT AND FUTURE EQUIPMENT.
7. EACH FIREPLACE EQUIPMENT AREA REQUIRES 2 DEDICATED 120 VAC, 20 AMP 60 HZ POWER LINES AVAILABLE AT THE ASSOCIATED HIGH LEVEL PULL BOX.
8. EACH VENTILATION FAN REQUIRES A DEDICATED POWER LINE (VOLTAGE AND CURRENT RATING BASED ON THE SIZE OF THE SELECTED FAN) AVAILABLE AT THE VENTILATION FAN CONTROL ENCLOSURE LOCATED AT THE INDICATED FIREPLACE EQUIPMENT AREA. A DISCONNECT BOX SHALL BE PROVIDED AT EACH VENTILATION FAN AT AN ACCESSIBLE LOCATION.
9. REFER TO THE ELECTRICAL RISER DIAGRAM IN THIS DRAWING PACKAGE FOR THE ROUTING OF THE WATERPROOF CONDUIT IN THE BURN BUILDING. CONDUIT INSTALLATION SHALL ACCOMMODATE ALL CURRENT AND FUTURE EQUIPMENT.
   a. THE HIGH AND LOW LEVEL PULL BOXES LOCATED IN EACH FIREPLACE EQUIPMENT AREA SHALL BE 12" x 12" x 8" DEEP.
   b. EACH CONDUIT STUB-UP LOCATED OUTSIDE OF THE FIREPLACE EQUIPMENT AREAS SHALL BE 6" ABOVE FINISHED SURFACE AND CAPPED.
10. THE 1'-6" x 2'-6" PENETRATION SHALL BE PROVIDED WITH A 1/8"-3/16" THICK CORROSION RESISTANT STEEL SLEEVE THAT EXTENDS FROM THE SURFACE OF THE EQUIPMENT AREA WALL TO THE SURFACE OF THE TRAINING COMPARTMENT LINING MATERIAL. THE 7" PENETRATION SHALL BE PROVIDED WITH A 1/8"-1/4" THICK CORROSION RESISTANT STEEL SLEEVE THAT EXTENDS FROM THE SURFACE OF THE EQUIPMENT AREA WALL TO THE SURFACE OF THE TRAINING COMPARTMENT LINING MATERIAL.

REV	A	DATE	28OCT98	DWN	JRE	12OCT98
CHKD						10/29/98
ENG						10/29/98

SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

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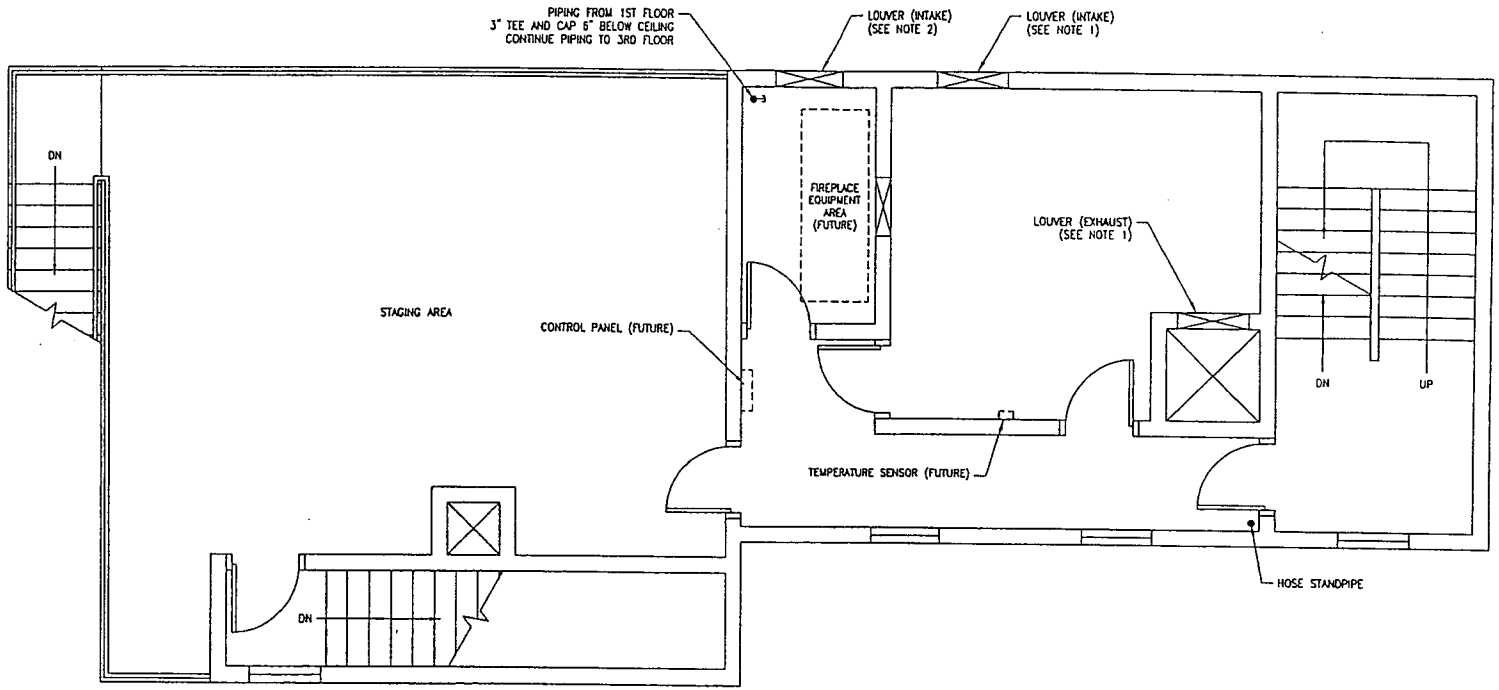
CAD FILE	IGD0091A2	SHEET	2 OF –

APPENDIX F



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ENG							

SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

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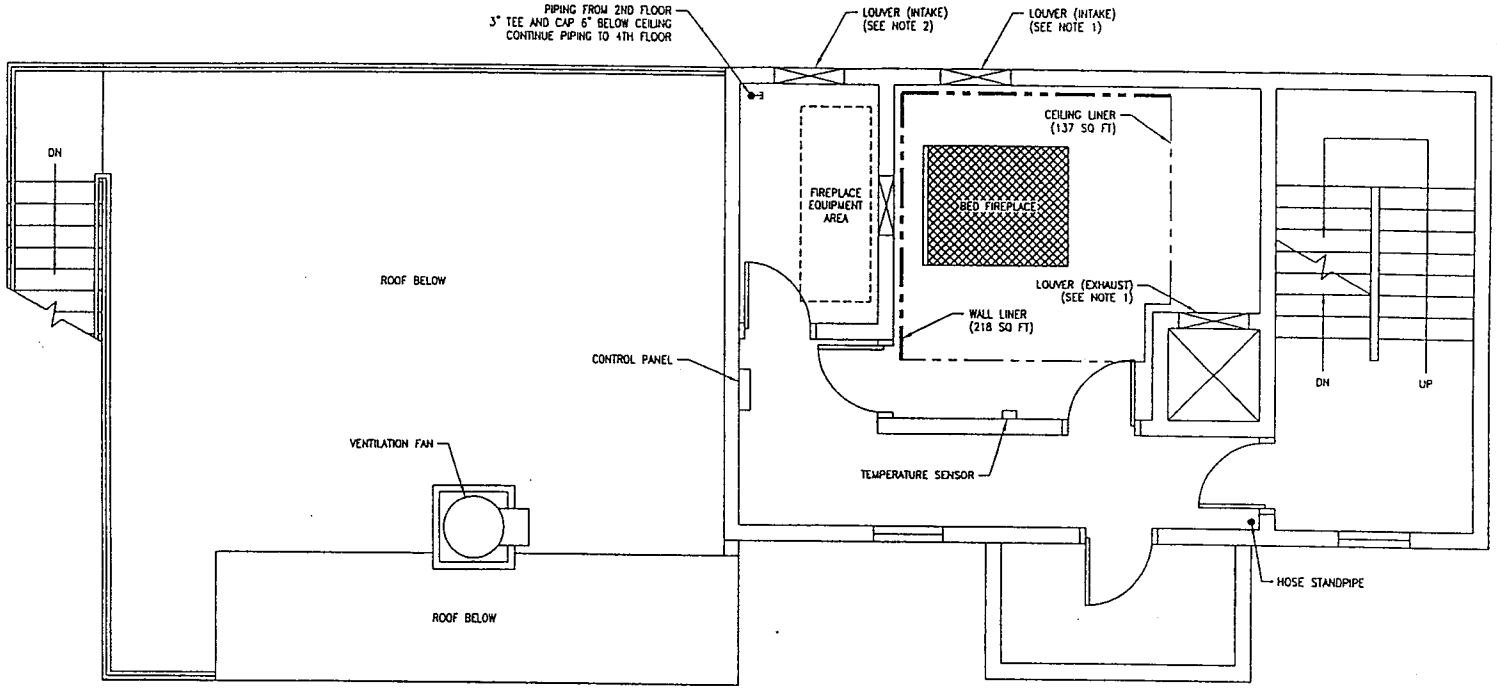
CAD FILE IGD0091A3 | SHEET 3 OF -

APPENDIX F



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CHKD						
ENG						

SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

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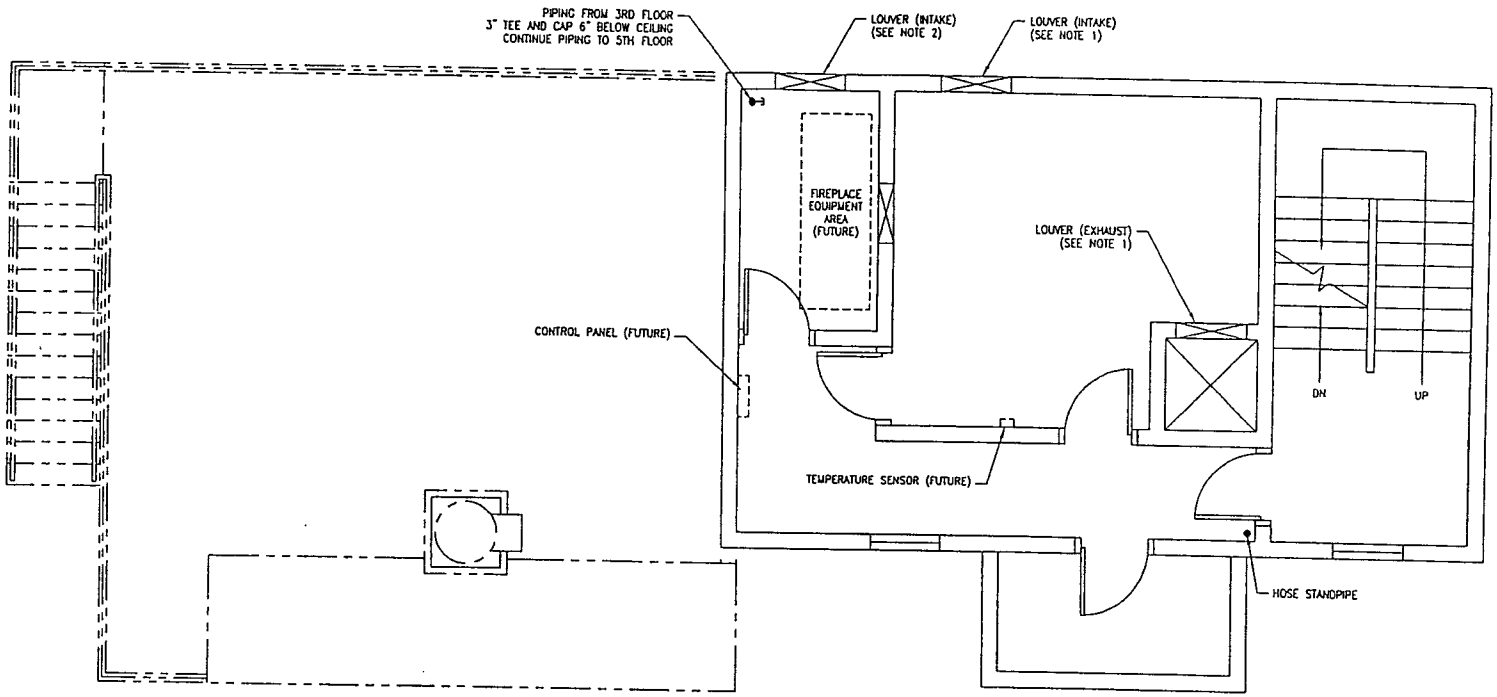
CAD FILE	IGD0091A4	SHEET	4 OF -

APPENDIX F



FOURTH FLOOR

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				CHKD		10/29/98
				ENG		10/29/98

SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

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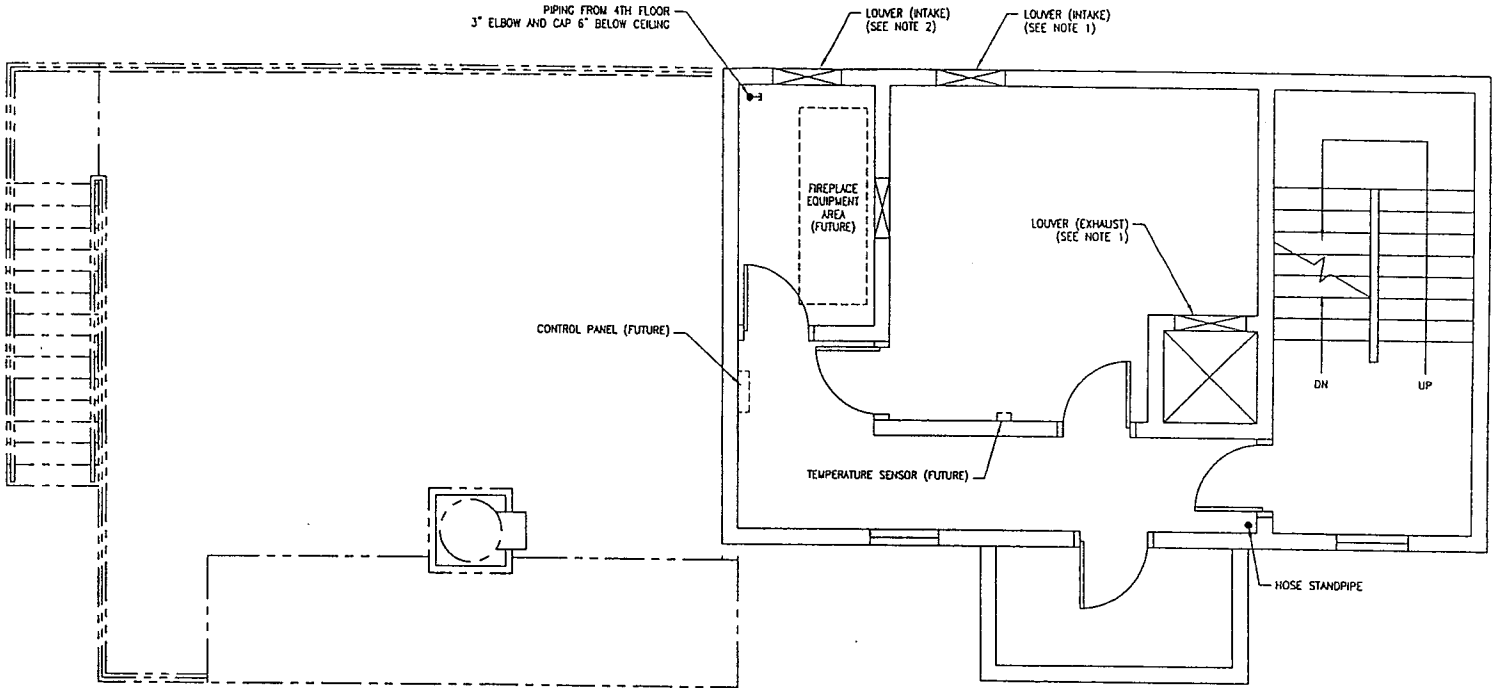
CAD FILE	IGD0091AS	SHEET	5 OF -

APPENDIX F



FIFTH FLOOR

SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

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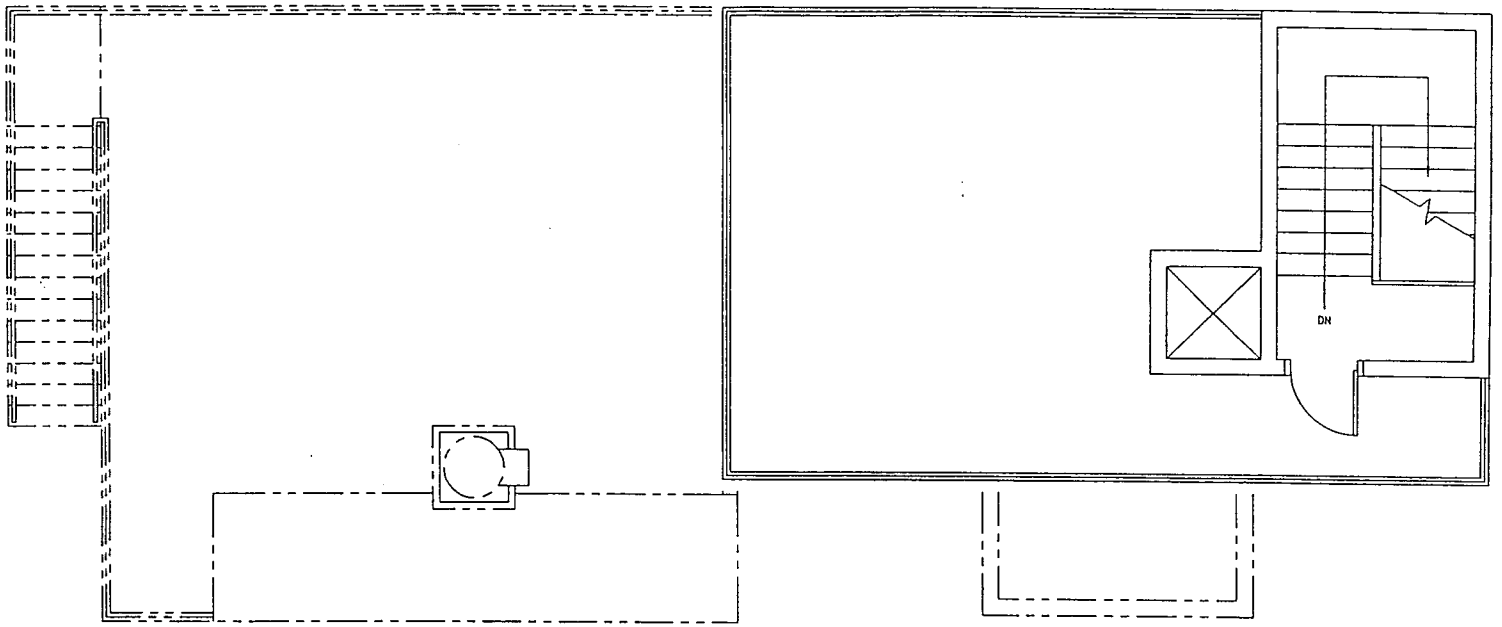
				CHKD		10/29/98
				ENG		12/21/98

SCALE 3/8" = 1'-0" | DWG NO ICD-0091

CAD FILE ICD0091A6 | SHEET 6 OF –

APPENDIX F



TOWER ROOF

REV	A	DATE	28OCT98	DWN	JRE	12OCT98
CHKD						
ENG						

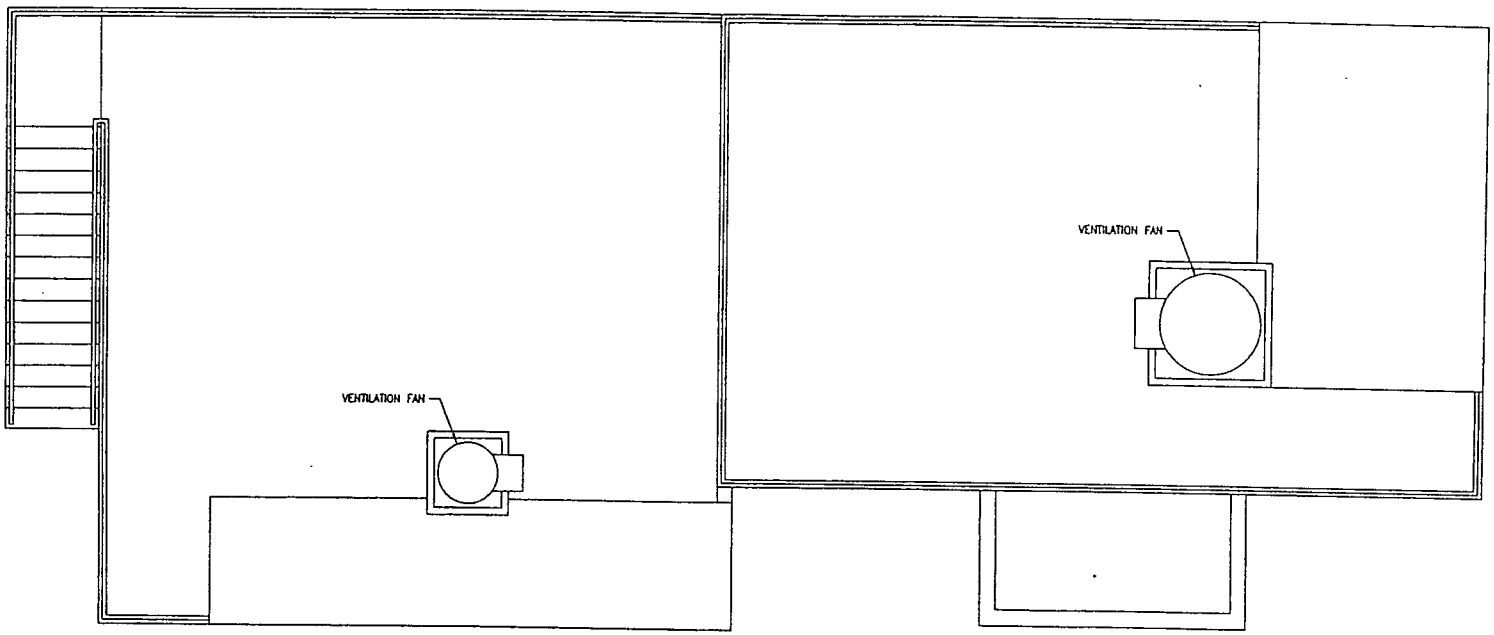
SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

SCALE	3/8" = 1'-0"	DWG NO	IGD-0091
CAD FILE	IGD0091A7	SHEET	7 OF -

APPENDIX F



ROOF PLAN

REV	A	DATE	28OCT98	DWN	JRE	12OCT98
				CHKD		10/14/98
				ENG		

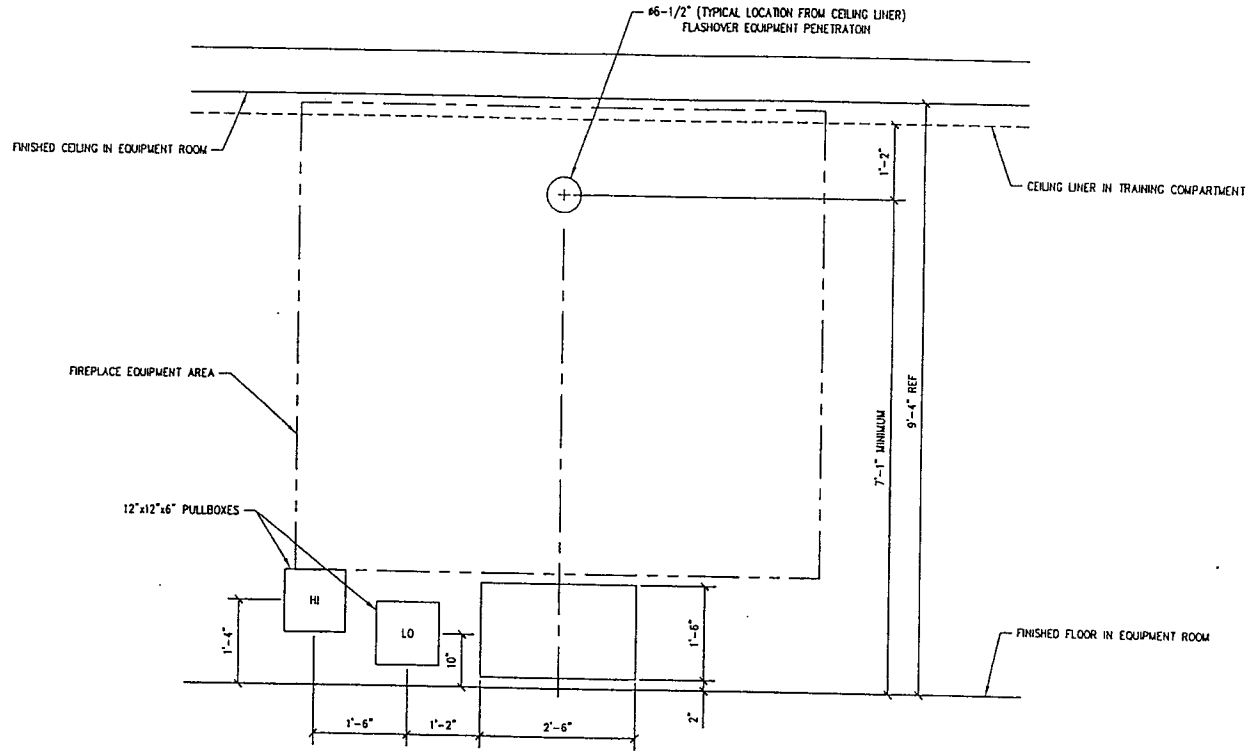
SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

SCALE	3/8" = 1'-0"	DWG NO	IGD-0091
CAD FILE	IGD0091A8	SHEET	8 OF -

APPENDIX F



PENETRATION AND PULLBOX DETAIL

TYPICAL FOR EACH FIREPLACE
(RECOMMEND INCLUDING FIREPLACE AND FLASHOVER PENETRATIONS AT ALL LOCATIONS FOR FUTURE EXPANSION)

REV	-	DATE		DWN	JRE	12OCT98
				CHKD		10/12/98
				ENG		10/29

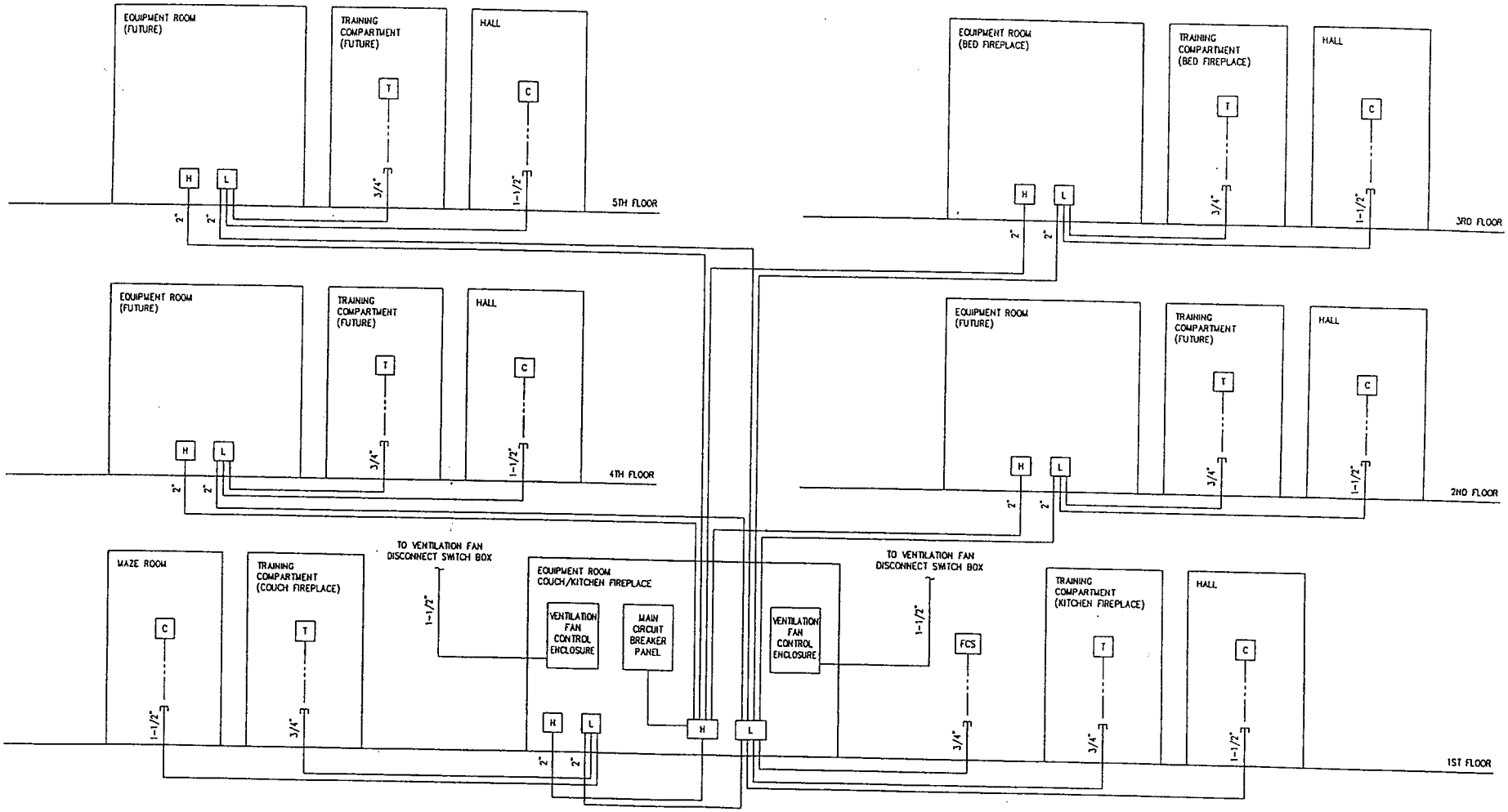
SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

SCALE	1" = 1'-0"	DWG NO	IGD-0091
CAD FILE	IGD0091A9	SHEET	9 OF -

APPENDIX F



LEGEND

- C — CONTROL PANEL
- FRCS — FUEL REGULATION AND CONTROL STATION
- T — TEMPERATURE SENSOR
- ——— CONDUIT

SUPPLIED BY SYMTRON SYSTEMS

- H — HIGH LEVEL PULLBOX
- L — LOW LEVEL PULLBOX
- ——— CONDUIT

RIGID METAL CONDUIT RISER DIAGRAM

REV	-	DATE		DWN	JRE	12OCT98
				CHKD		10/29/98
				ENG		10/29/98

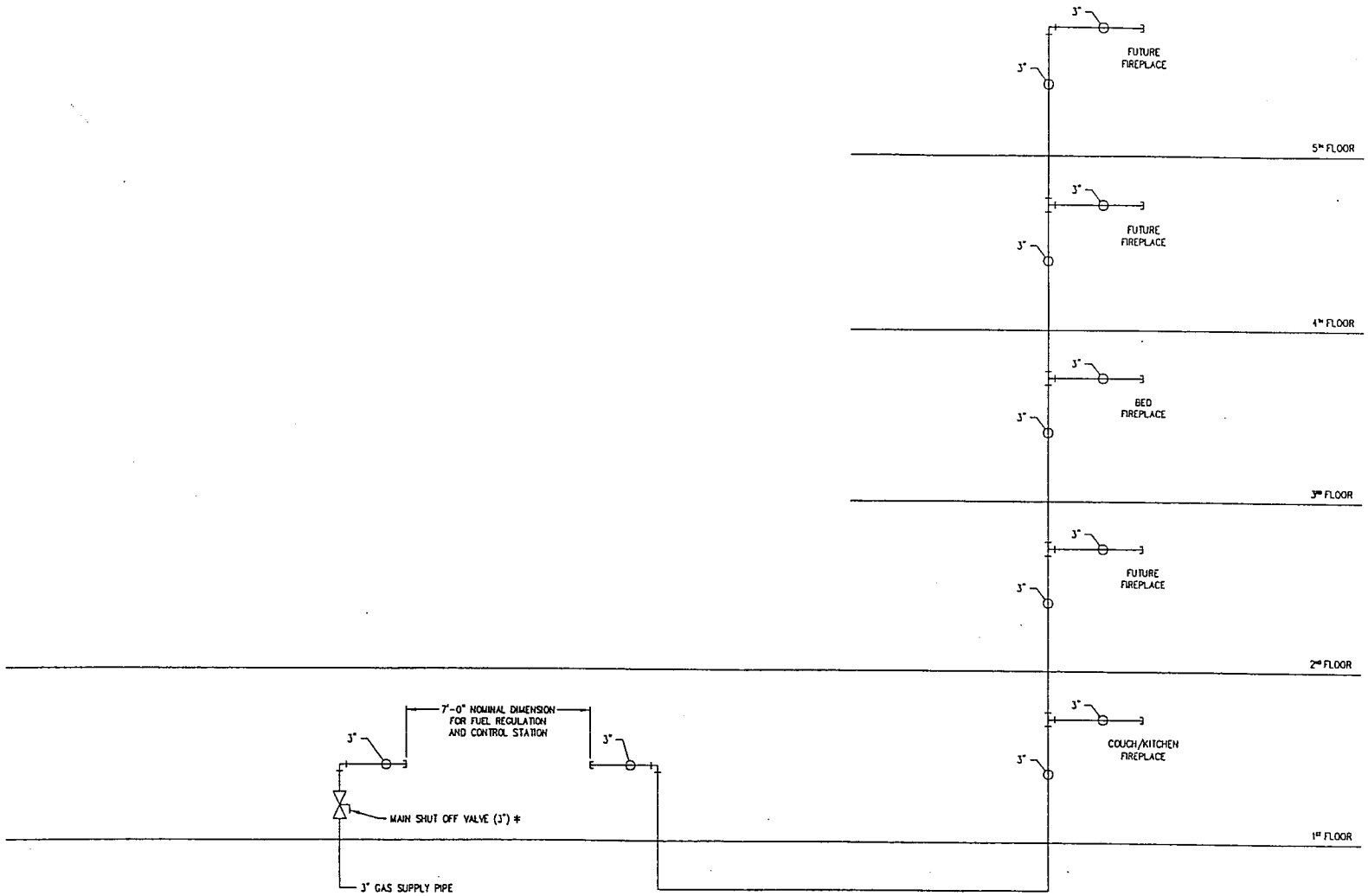
SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE: MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

SCALE	-	DWG NO	IGD-0091
CAD FILE	IGD0091A0	SHEET	10 OF -

APPENDIX F



* CONBRACO INDUSTRIES INC., APOLLO DIVISION: 3" FULL PORT BALL VALVE PN: 80-100-01 OR APPROVED EQUIVALENT

GAS PIPE RISER DIAGRAM

REV	A	DATE	28OCT98	DWN	JRE	12OCT98
				CHKD		10/14/98
				ENG		10/29/98

SYMTRON SYSTEMS inc.

INSTALLATION GUIDELINES DOCUMENT

TITLE MONTGOMERY COUNTY FIRE TRAINING CENTER AT THE WOODLANDS

SCALE	-	DWG NO	IGD-0091
CAD FILE	IGD0091AA	SHEET	11 OF -

SYMTRON SYSTEMS inc.

September 29, 1997 2 Page FAX

The WOODLANDS FIRE DEPARTMENT
Attention: Steve Parker
Subject: Cost Estimates

Dear Steve:

The following "Rough order of Magnitude" price estimate is for your review. Let's discuss this afternoon.

Best Regards,

Terry L. Haymond

Telephone: 949/640-6193 Fax: 949/640-8193 Pager/Voice Mail: 800/453-6216
e-mail: haymond@worldnet.att.net

APPENDIX G

ROM Cost Estimates for
The WOODLANDS FIRE DEPARTMENT - Five Story
3,720square feet Pre-Engineered Metal Training Tower & Burn Building
Environmentally Safe, Live Fire Training Simulator,
Ventilation System, High Temperature Lining &
Thermal Smoke Generation System

CONSTUCTION COST ESTIMATES

1.	**New Training Tower and Burn Building** Construction - 3,720 sf @ $85/sf	$ 316,200
2.	**Architecture and Engineering** - 8% of Construction Cost	$ 25,296
3.	**Contingency** - 10%	$ 31,620
	Total Construction Estimate	$ 373,116

PROP COSTS ESTIMATES - Computer Controlled Simulators

1.	**First Floor** - Kitchen Fire with Flashback	
	A. Engineering (Drawings & Site Inspection)	$ 27,500
	B. Computer Controlled, Natural Gas, Live Fire Simulator	$ 125,000
	C. Flashback Simulator	$ 27,500
	D. Equipment and Installation	$ 70,000
	1. Ventilation System	
	2. High Temperature Lining of Training Burn Room	
	3. Thermal Smoke Generator	
	SubtotalProp Cost	$ 250,000
2.	**First Floor** - Couch / Industrial Fire with Flashover	
	A. Computer Controlled, Natural Gas, Live Fire Simulator	$ 115,000
	C. Flashback Simulator	$ 27,500
	D. Equipment and Installation	$ 55,000
	1. Ventilation System	
	2. High Temperature Lining of Training Burn Room	
	3. Thermal Smoke Generator	
	SubtotalProp Cost	$ 197,500

3.	**Third Floor -** Bedroom Fire with Flashover		
	A.	Computer Controlled, Natural Gas, Live Fire Simulator	$ 115,000
	C.	Flashback Simulator	$ 27,500
	D.	Equipment and Installation	$ 55,000
		1. Ventilation System	
		2. High Temperature Lining of Training Burn Room	
		3. Thermal Smoke Generator	
		SubtotalProp Cost	$ 197,500
		TOTAL PROJECT ESTIMATE	**$1,018,116**

ROM Cost estimate ***does not*** include Site Work

FIRE FACILITIES INC.

BOX 834 • ANTIOCH, ILLINOIS • 60002 • 1-800-92-WESCO • 1-800-929-3726 • 414-862-6799 • FAX 414-862-6980

Wesco® Steel Erection Prices

NOVEMBER 1, 1997

The following are steel erection costs as applied to Wesco's "standard design" towers, erected on foundations by others. These prices are valid for projects located within a one thousand mile radius of our shipping point, Madison, Wisconsin. Costs of bonds, permits or other fees are not included nor are prevailing wage statutory requirements.

MODEL	STEEL ERECTION
WS-2	$24,500.00
WS-3	$29,300.00
WH-3S	$32,300.00
WS-4	$43,300.00
WH-2	$41,300.00
WH-4	$54,100.00

FIRE FACILITIES INC.

BOX 834 • ANTIOCH, ILLINOIS • 60002 • 1-800-92-WESCO • 1-800-929-3726 • 414-862-6799 • FAX 414-862-6980

PRICE LIST

NOVEMBER 1, 1997

Wesco® Towers are offered with factory applied, colored wall panels and trim. Towers are also offered without color. The galvanealed steel walls are easily field painted. All WS & WH models are complete with a live fire burn room.

MODEL	UNPAINTED	PAINTED
WS-1	$ 28,048.00	$ 30,615.00
WS-2	$ 56,879.00	$ 60,615.00
WS-3	$ 66,643.00	$ 69,655.00
WH-3S	$ 70,985.00	$ 75,655.00
WS-4	$110,020.00	$113,020.00
WH-2	$ 83,376.00	$ 86,022.00
WH-4	$122,297.00	$133,575.00

MOBILE BURN ROOMS

MBR-28 $69,000.00

MBR-25 $ 67,000.00

Swede Survival Systems, Inc.

QUOTATION FOR FLASHOVER CONTAINER SYSTEM & EDUCATIONAL PROGRAM
PHASE 1 PROGRAM WILL INCLUDE

- Complete Container System built to specifications of Swede Survival Systems.
- Three day advanced "Train The Trainer" Course conducted by two certified instructors and will include the following:

1. Ignition Sources
2. Fire Behavior
3. Formation of Fire Gases
4. Fire Control
5. Container Operations
6. Hydration
7. Heat Stress
8. SCBA and Safety Equipment Training
9. Heat Stress Management
10. Recognition of Pre-Flashover Conditions
11. Smoke and Ventilation Exercises
12. Nozzle Technique
13. Container Management
14. Safety

- One T.A. "Fogfighter" Nozzle.

Container System meets or exceeds N.F.P.A. 1403 and 1500 Standards.

CONTAINER SYSTEM SPECIFICATIONS AND SET-UP REQUIREMENTS

1. Physical:

Dimensions:
Burn Container: 10' Long, 8' Wide, 11' High
Observation Container: 20' Long, 8' Wide, 8' High
Weight:
Total Weight: Approximately 12000 pounds.

2. Construction and Included Items:

- 14 Gauge Steel
- 5/8" Chain on Walls, Ceiling and Doors of Burn Container
- Cooling Ventilation System
- Concrete Paving to Line Floor of Burn Container
- Pike Pole for Loading Particle Board
- Crib Fire Drum
- Spring loaded entry doors without locks
- Access for Hose Line
- Jacks for additional Support of Burn Container
- Fully insulated Burn Container/Partek high performance insulation

3. Site Requirement:

a. Level pad of either concrete or gravel with average dimensions of not less than 14' Wide and 36' Long (504 sq ft).

b. No foundation or drainage system required.

c. Burn Container to be placed directly into prevailing wind, if applicable.

d. Equipment required for set-up: Large capacity fork-lift truck, with extended arms or crane. Set-up time is approximately one hour.

e. SET-UP IS THE RESPONSIBILITY OF PURCHASING AUTHORITY.

PROGRAM COST, PLUS FREIGHT AND APPLICABLE TAXES $32350.00

TERMS: NET 30.

APPENDIX I

Fire Chief Ellen
Conroe Fire Department
P. O. Box 3066
Conroe, TX 77305

Fire Chief Oliphant
Cut-N-Shoot VFD
P. O. Box 7355
Cut-N-Shoot, TX 77303

Fire Chief Mikeska, Jr.
Lake Conroe VFD
10900 Hwy 105 W
Montgomery, TX 77356

Fire Chief Brochard
Grangerland VFD
P. O. Box 8666
Grangerland, TX 77302

Fire Chief Edwards
Montgomery VFD
P. O. Box 693
Montgomery, TX 77356

Fire Chief Buchanan
Needham Road VFD
9430 SH 242 East
Conroe, TX 77385

Fire Chief Irvin
Bennette Estates VFD
14590 Lyric Rd
Conroe, TX 77302

Fire Chief Rhodes
Magnolia Bend VFD
P. O. Box 2232
Conroe, TX 77305

Fire Chief Loll
N. Montgomery Cnty VFD
P. O. Box 1465
Willis, TX 77378

Fire Chief Rogers
S. Montgomery Coty VFD
335 Volunteer Ln
Spring, TX 77380

Fire Chief Binnion
Porter VFD
P. O. Box 42
Porter, TX 77356

Fire Chief Cox
Timberlakes VFD
P. O. Box 8361
The Woodlands, TX 77387

Fire Chief Yancy
New Caney VFD
Rt 2, Box 603
New Caney, TX 77357

Fire Chief Daniels
Splendora VFD
P. O. Box 542
Splendora, TX 77372

Fire Chief Ringler
Magnolia VFD
P. O. Box 473
Magnolia, TX 77355

Fire Chief Langford
Spring VFD
P. O. Box 121
Spring, TX 77383

Fire Chief Windisch
Ponderosa VFD
P. O. Box 90674
Houston, TX 77290

Fire Chief Jones
Klein VFD
P. O. Box 11009
Klein, TX 77391

Fire Chief Gammon
Tomball VFD
1200 Rudel
Tomball, TX 77375